

Trend Study 7-8-01

Study site name: Hailstone.

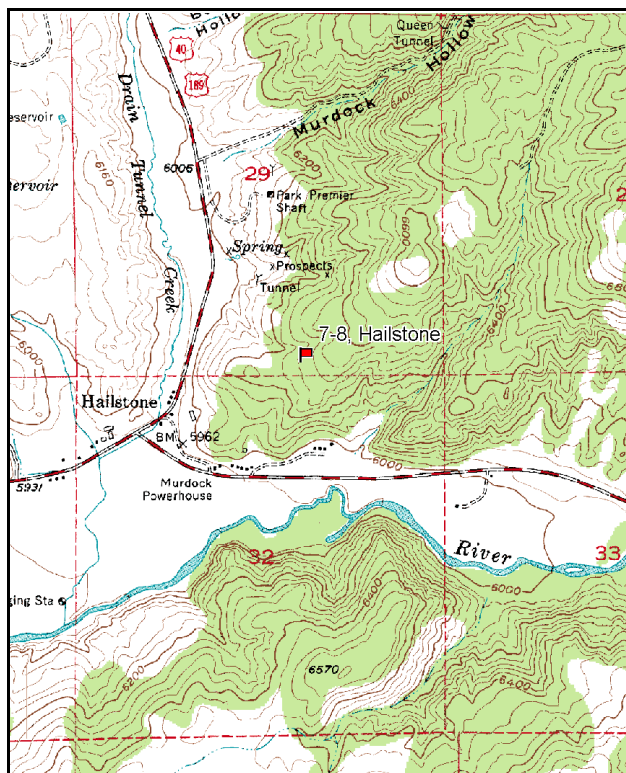
Vegetation type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 159 degrees magnetic.

Frequency belt placement: Line 1 (11 & 95ft), line 2 (59ft), line 3 (71ft), line 4 (34ft).

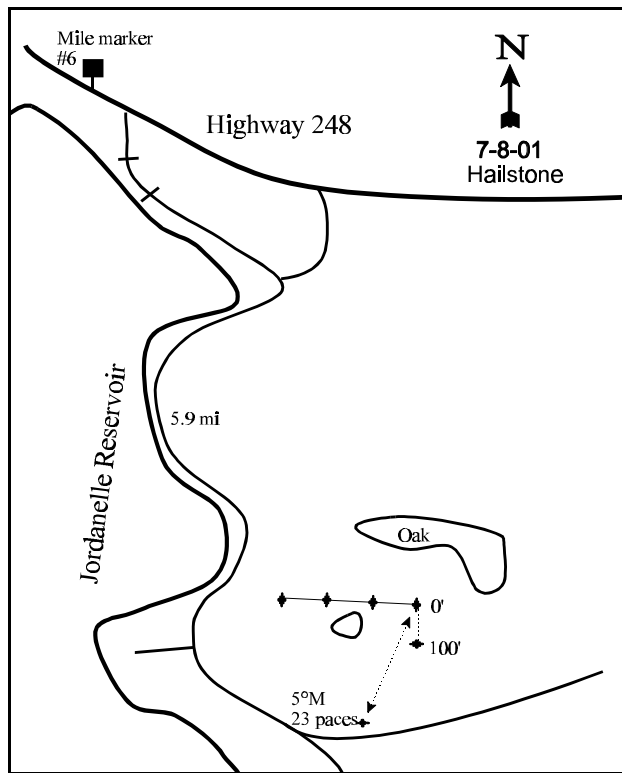
LOCATION DESCRIPTION

Just past mile marker #6 on highway 248, turn right (south) and follow the road around the east side of Jordanelle Reservoir for 5.9 miles to a fork in the road and a witness post. The fork is 0.3 miles east of the monument. From the witness post walk 23 paces at 5 degrees magnetic to the 0-foot baseline stake. Line 1 of the baseline runs 159 degrees magnetic. The rest of the baseline runs off the 0-foot baseline stake at a bearing of 248 degrees magnetic. If the gates are locked at the beginning, either obtain a key from the regional biologist, find another way around the fence or go up the road and follow the power line road which comes out above the site. It is advisable to notify a state park ranger of intentions to drive to site.



Map Name: Heber

Township 2S, Range 5E, Section 29



Diagrammatic Sketch

UTM 4495365 N 465957 E

DISCUSSION

Trend Study No. 7-8

The Hailstone trend study was originally established northeast of the old Hailstone Junction of highways 40 and 32. With the creation of Jordanelle reservoir, the trend study is now located about one-half of a mile from the east shore of the reservoir. This site was established in 1984. The study area consists of mixed mountain big sagebrush-grass with scattered clumps of Gambel oakbrush. It received relatively little deer or elk use in 1984 and 1990, but the area has become much more important after Jordanelle Reservoir was constructed. With Jordanelle completed in the early 1990's, north to south movements across the Provo River become impossible, or at least very difficult, and the winter range on the north and east side of the reservoir became more vital than was the case in 1984. The site is placed on a southwest facing ridge with a moderate slope of 15% to 18%. Elevation is about 6,200 feet. Quadrat frequency of deer pellet groups was moderate at 25% in 1996 and slightly higher at 29% in 2001. A pellet group transect read on the site in 2001 estimated 55 deer days use/acre (136 ddu/ha). A couple of elk pellet groups were also encountered. Most of the deer pellet groups appear to be recent, indicating use during the summer.

Soil type is very similar to that described for Study Number 7-7 with a slightly higher surface rock cover. Soil is classified as mountain Stoney loam. Permeability is moderate, available water capacity is low and root penetration is somewhat limited. These soils have a moderately low erosion hazard. Effective rooting depth is estimated at almost 12 inches with a slightly acidic soil reaction (6.5 pH). The soil texture is a clay loam with an organic matter content of 4.6%. There is abundant vegetation and litter cover leaving little unprotected bare soil. There is little erosion occurring and the erosion condition class was determined to be stable in 2001. Where limited erosion has occurred in the past, it now appears stable. Erosion is minimal except where roads, power line construction, and quarrying activity have occurred. These areas are subject to some active gully formation.

This study is within a mountain big sagebrush-grass opening that is characterized by a moderately dense stand of large mountain big sagebrush, with lesser amounts of mountain snowberry, antelope bitterbrush, and Gambel oak interspersed throughout. Sagebrush totally dominates the browse component on the site by providing about 90% of the browse cover. At first glance, the big sagebrush population appears highly decadent, in fact, many of the large older plants do have appreciable percentages of dead crown. Utilization, however, is uniformly light, indicating other causes for the high percent decadence. Crown die-back is most likely the result of winter injury, drought, and intraspecies competition. The population is comprised primarily of large mature plants that in the past were mostly decadent. About half of the plants sampled in 1984 and 1990 were decadent. Density was estimated at nearly 8,000 plants/acre in 1984, declining to 6,799 in 1990. A larger sample was taken in 1996, which is more representative of the area. Density was estimated at 4,560 plants/acre in 1996 and percent decadence declined to 18%. The population remained at a stable density in 2001, but percent decadence nearly doubled to 33%. In addition, 36% (547 plants/acre) of the decadent plants sampled were classified as dying. Reproduction has been good in most years but young plants accounted for only 3% of the population in 2001, down from 11% in 1996. The big sagebrush population will continue to dominate this community and will continue to suppress other shrub and herbaceous species.

Understory vegetation is sparse and consists largely of cheatgrass brome, Kentucky bluegrass, Sandberg bluegrass, and a wide variety of forbs. The most important and palatable perennial forbs consist of showy goldeneye, silky lupine, and redroot eriogonum.

1984 APPARENT TREND ASSESSMENT

Soil trend appears stable. Although there are a few long established gullies in the vicinity, these are not rapidly expanding. Sheet erosion is evident but is of small magnitude. Soil loss does not appear growth limiting. However, this area does have a shallow soil that has moderate to high erosion potential. Soil trend deserves careful monitoring. Vegetative trend also appears stable. The Gambel oakbrush areas are static in terms of the area they occupy. Oak may be growing in height and becoming even more exclusive of other vegetation. Oak clumps customarily have almost no understory and litter provides a nearly complete ground cover. In the mountain big sagebrush areas, there have been very slight but perhaps temporary improvements in understory diversity and production. Overall trend for these areas is judged stable because no significant signs of change in the dominant sagebrush population can be detected.

1990 TREND ASSESSMENT

Mountain big sagebrush has less growth and seed production, although vigor is normal compared to the wet year when the study was established. The shrubs are moderately to heavily hedged. Sagebrush density shows a slight decrease (15%). A lower percentage (46%) of decadent plants was classified in 1990, which is still high. Sagebrush cover averages almost 30%. Seedlings are abundant this year. Frequencies of the other browse species remain low but stable. Oakbrush has not increased. Oak shows moderate hedging on the available stems, more use than typically observed on oak on this type of site. The grass sum of nested frequency is extremely low and the herbaceous component is lacking. Ground cover percentages are also unchanged. There is adequate litter and aerial vegetative cover with no significant erosion.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable, but still poor condition (3)

1996 TREND ASSESSMENT

Trend for soils is stable with an excellent ratio of protective cover (vegetation and litter) to bare ground. The only negative aspect is that most of the vegetative cover is made up of sagebrush which is not as effective at preventing erosion as herbaceous cover. The key browse species is obviously sagebrush, which contributes 93% of the browse cover. The age structure is drifting again to a mostly mature population. Percent decadence has decreased from 57% in 1984, to 46% in 1990, and down to 18% in 1996. The population appears stable now, with the thinning effect of long-term drought (1987-90) and intraspecific competition. The herbaceous understory trend for perennial species is slightly improved, but still in very poor condition (composition and abundance).

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up slightly but poor (4)

2001 TREND ASSESSMENT

Trend for soil continues to be stable with abundant vegetation and litter cover to prevent most erosion. Unfortunately most of the vegetation cover comes from sagebrush which is not as effective as herbaceous cover at preventing erosion. Trend for the key browse species, mountain big sagebrush, is stable. The sagebrush population has remained stable, but percent decadence has increased from 18% to 33%. In

addition, 36% of the decadent sagebrush sampled were classified as dying (>50% crown death) which is equivalent to 547 plants/acre. Young recruitment is currently not adequate to maintain the current population. The population may thin slightly in the future, but this would be a positive change considering the density of the sagebrush stand. Trend for the herbaceous understory is up but still limited by sagebrush. Sum of nested frequency for perennial grasses increased slightly, while sum of nested frequency for perennial forbs more than doubled. Perennial grasses are still limited but nested frequency of Kentucky bluegrass increased significantly. Another positive change is the significant decline in the nested frequency of cheatgrass. Cover of cheatgrass also declined from 15% to only 2%. The dramatic increase in the sum of nested frequency for perennial forbs comes primarily from the significant increase in the nested frequency of silky lupine. Average cover of lupine also increased from less than 1% in 1996 to 6% in 2001. Wild onion, a milkvetch, and longleaf phlox also increased significantly in nested frequency. Sum of nested frequency and cover of annual forbs remained similar to 1996.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up, but still very limited (5)

HERBACEOUS TRENDS --

Herd unit 07 , Study no: 8

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
G	Agropyron spicatum	-	1	5	6	-	1	3	3	.09	.18
G	Bromus japonicus (a)	-	-	2	7	-	-	1	3	.00	.01
G	Bromus tectorum (a)	-	-	_b 342	_a 175	-	-	96	68	14.50	1.48
G	Carex spp.	-	-	-	5	-	-	-	2	.03	.38
G	Poa pratensis	_a 4	_a 10	_b 55	_c 83	1	4	15	26	2.68	3.49
G	Poa secunda	-	-	4	-	-	-	1	-	.00	-
G	Sitanion hystrix	_a -	_a 2	_b 33	_b 48	-	1	14	21	1.06	2.17
G	Stipa lettermani	-	2	3	3	-	1	1	1	.15	.03
Total for Annual Grasses		0	0	344	182	0	0	97	71	14.50	1.49
Total for Perennial Grasses		4	15	100	145	1	7	34	53	4.01	6.27
Total for Grasses		4	15	444	327	1	7	131	124	18.52	7.77
F	Achillea millefolium	-	-	1	-	-	-	1	-	.03	-
F	Alyssum alyssoides (a)	-	-	4	2	-	-	2	1	.01	.00
F	Allium spp.	_a -	_a -	_b 21	_c 59	-	-	11	25	.05	.27
F	Artemisia ludoviciana	6	-	1	2	2	-	1	1	.00	.03
F	Aster chilensis	-	-	7	8	-	-	2	3	.30	.33
F	Astragalus convallarius	5	3	4	9	2	1	2	5	.01	.36
F	Astragalus spp.	_a -	_a -	_a -	_b 12	-	-	-	5	-	.67
F	Camelina microcarpa (a)	-	-	3	2	-	-	1	1	.00	.00
F	Calochortus nuttallii	-	-	-	9	-	-	-	4	-	.02

T y p e	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
F	<i>Chenopodium fremontii</i> (a)	-	-	-	1	-	-	-	1	-	.00
F	<i>Cirsium undulatum</i>	10	4	8	12	6	2	5	4	.21	.53
F	<i>Collomia linearis</i> (a)	-	-	52	62	-	-	27	30	.16	.15
F	<i>Comandra pallida</i>	4	-	2	13	2	-	1	4	.04	.12
F	<i>Collinsia parviflora</i> (a)	-	-	_a 5	_b 71	-	-	3	27	.01	.45
F	<i>Cordylanthus ramosus</i> (a)	-	-	43	23	-	-	19	12	.95	.76
F	<i>Epilobium brachycarpum</i> (a)	-	-	_b 112	_a 20	-	-	51	12	.94	.11
F	<i>Erigeron</i> spp.	-	-	1	-	-	-	1	-	.00	-
F	<i>Eriogonum racemosum</i>	14	14	11	14	7	8	6	8	.11	.12
F	<i>Galium aparine</i> (a)	-	-	-	3	-	-	-	1	-	.00
F	<i>Hedysarum boreale</i>	_b 6	_a -	_a 1	_a -	5	-	1	-	.00	-
F	<i>Holosteum umbellatum</i> (a)	-	-	_a -	_b 12	-	-	-	5	-	.05
F	<i>Lithospermum ruderae</i>	-	3	-	-	-	1	-	-	-	-
F	<i>Lomatium</i> spp.	-	-	4	7	-	-	2	4	.01	.04
F	<i>Lupinus argenteus</i>	_b 75	_a 15	_a 14	_b 113	35	7	7	46	.69	6.10
F	<i>Microsteris gracilis</i> (a)	-	-	_a 3	_b 13	-	-	1	8	.00	.04
F	<i>Phlox longifolia</i>	_a -	_a 4	_b 22	_c 37	-	2	10	16	.22	.18
F	<i>Polygonum douglasii</i> (a)	-	-	86	100	-	-	36	42	.18	.26
F	<i>Ranunculus testiculatus</i> (a)	_a -	_a -	_a -	_b 81	-	-	-	30	-	.74
F	<i>Tragopogon dubius</i>	-	-	3	1	-	-	1	1	.00	.00
F	<i>Trifolium</i> spp.	-	-	-	7	-	-	-	3	-	.04
F	<i>Verbascum thapsus</i>	6	3	2	-	3	1	1	-	.03	-
F	<i>Vicia americana</i>	-	4	-	-	-	1	-	-	-	-
F	<i>Viguiera multiflora</i>	_a 19	_b 51	_{ab} 27	_a 14	11	23	15	6	.28	.08
Total for Annual Forbs		0	0	308	390	0	0	140	170	2.28	2.59
Total for Perennial Forbs		145	101	129	317	73	46	67	135	2.01	8.93
Total for Forbs		145	101	437	707	73	46	207	305	4.30	11.53

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 07 , Study no: 8

T y p e	Species	Strip Frequency		Average Cover %	
		'96	'01	'96	'01
B	Amelanchier alnifolia	0	3	-	.41
B	Artemisia tridentata vaseyana	99	93	29.54	34.81
B	Chrysothamnus viscidiflorus viscidiflorus	2	3	.03	.15
B	Mahonia repens	11	17	.87	.83
B	Opuntia spp.	1	1	.03	.15
B	Purshia tridentata	4	5	.68	1.06
B	Quercus gambelii	3	7	.06	.68
B	Symphoricarpos oreophilus	9	10	.51	.63
Total for Browse		129	139	31.73	38.73

BASIC COVER --

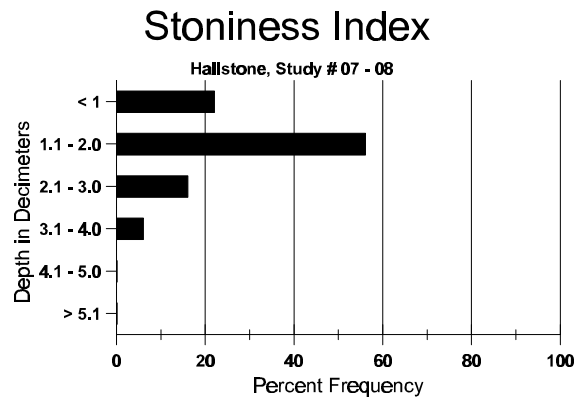
Herd unit 07 , Study no: 8

Cover Type	Nested Frequency		Average Cover %			
	'96	'01	'84	'90	'96	'01
Vegetation	376	337	1.50	5.00	47.30	55.46
Rock	209	166	11.00	5.50	3.26	3.40
Pavement	210	260	8.75	15.50	5.63	11.04
Litter	397	378	70.25	66.75	56.90	51.26
Cryptogams	9	8	0	0	.12	.12
Bare Ground	174	164	8.50	7.25	6.07	7.04

SOIL ANALYSIS DATA --

Herd Unit 07, Study no: 08, Hailstone

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
11.6	53.0 (13.8)	6.5	40.2	29.1	30.7	4.6	41.6	377.6	.6



PELLET GROUP FREQUENCY --

Herd unit 07 , Study no: 8

Type	Quadrat Frequency	
	'96	'01
Rabbit	5	2
Elk	1	-
Deer	25	29

Pellet Transect	
Pellet Groups per Acre 01	Days Use per Acre (ha) 01
-	-
17	1 (3)
713	55 (136)

BROWSE CHARACTERISTICS --

Herd unit 07 , Study no: 8

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total					
		1	2	3	4									
Amelanchier alnifolia														
S	84	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	0		0	
	01	1	-	-	-	-	-	-	-	-	20		1	
Y	84	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	1	-	-	-	-	20		1	
M	84	2	-	-	-	-	-	-	-	-	133	19	14	2
	90	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	0	19	14	0
	01	-	-	1	-	1	-	-	-	-	40	26	43	2
D	84	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	1	-	-	66			1
	96	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>						
'84		00%		00%		00%		-50%						
'90		00%		00%		100%								
'96		00%		00%		00%								
'01		67%		33%		00%								
Total Plants/Acre (excluding Dead & Seedlings)										'84	133	Dec:	0%	
										'90	66		100%	
										'96	0		0%	
										'01	60		0%	

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	84	10	-	-	-	-	-	-	-	-	10	-	-	-	666		10	
	90	47	-	-	-	-	-	16	-	-	63	-	-	-	4200			63
	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	01	10	-	-	-	-	-	-	-	-	10	-	-	-	200			10
Y	84	23	-	-	-	-	-	-	-	-	23	-	-	-	1533		23	
	90	15	2	1	2	-	-	2	-	-	22	-	-	-	1466			22
	96	25	-	-	-	-	-	-	-	-	25	-	-	-	500			25
	01	4	3	-	-	-	-	-	-	-	7	-	-	-	140			7
M	84	22	7	-	-	-	-	-	-	-	29	-	-	-	1933	23	25	29
	90	11	17	5	-	-	-	-	-	-	32	-	1	-	2200	28	35	33
	96	131	28	-	2	-	-	-	-	-	161	-	-	-	3220	24	48	161
	01	134	2	3	9	-	-	-	-	-	148	-	-	-	2960	26	38	148
D	84	47	21	-	-	-	-	-	-	-	67	-	-	1	4533		68	
	90	12	20	12	2	1	-	-	-	-	30	-	1	16	3133			47
	96	26	12	3	1	-	-	-	-	-	26	-	-	16	840			42
	01	69	2	1	4	-	-	-	-	-	49	-	-	27	1520			76
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	820			41
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	500			25
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		23%			00%			.83%			-15%							
'90		39%			18%			18%			-33%							
'96		18%			01%			07%			+ 1%							
'01		03%			02%			12%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	7999	Dec:	57%			
												'90	6799		46%			
												'96	4560		18%			
												'01	4620		33%			
Cercocarpus montanus																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	28	16	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%										
'90		00%			00%			00%										
'96		00%			00%			00%										
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	0	Dec:	-			
												'90	0		-			
												'96	0		-			
												'01	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus viscidiflorus																		
Y	84	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	90	-	-	-	1	-	-	1	-	-	2	-	-	-	133		2	
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	84	2	-	-	-	-	-	-	-	-	2	-	-	-	133	9	4	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20	12	11	
	01	1	-	-	2	-	-	-	-	-	3	-	-	-	60	11	12	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%			-33%							
'90		00%			00%			00%			-70%							
'96		00%			00%			00%			+33%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	199	Dec:	-			
												'90	133		-			
												'96	40		-			
												'01	60		-			
Mahonia repens																		
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	20	-	-	-	-	-	-	-	-	20	-	-	-	400		20	
	01	7	-	-	4	-	-	-	-	-	11	-	-	-	220		11	
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	96	44	-	-	-	-	-	-	-	-	44	-	-	-	880	28	31	
	01	136	-	-	78	-	-	56	-	-	270	-	-	-	5400	3	5	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%										
'90		00%			00%			00%										
'96		00%			00%			00%			+77%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	0	Dec:	-			
												'90	0		-			
												'96	1280		-			
												'01	5620		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	9	-	-	-	-	-	-	-	-	9	-	-	-	600		9	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	84	9	-	-	-	-	-	-	-	-	9	-	-	-	600	4	5	9
	90	2	-	-	-	-	-	-	-	-	2	-	-	-	133	6	13	2
	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60	5	24	3
	01	3	-	-	-	-	-	-	-	-	3	-	-	-	60	5	6	3
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%			+25%							
'90		00%			00%			00%			-92%							
'96		00%			00%			00%			+ 0%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	600	Dec:	0%			
												'90	799		8%			
												'96	60		0%			
												'01	60		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
S	84	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	84	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	90	-	-	-	1	-	-	2	-	-	2	-	1	-	200		3	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	84	1	2	1	-	-	-	-	-	-	4	-	-	-	266	14	18	4
	90	-	1	2	-	1	-	-	-	-	4	-	-	-	266	7	23	4
	96	-	-	2	1	-	-	-	-	-	3	-	-	-	60	22	41	3
	01	-	-	2	-	-	-	-	-	-	2	-	-	-	40	24	45	2
D	84	-	3	4	-	-	-	-	-	-	7	-	-	-	466		7	
	90	-	-	2	-	-	-	-	-	-	2	-	-	-	133		2	
	96	-	-	-	-	-	1	-	-	-	1	-	-	-	20		1	
	01	-	-	-	-	-	3	-	-	1	3	-	-	1	80		4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		42%			42%			00%			-25%							
'90		22%			44%			11%			-87%							
'96		00%			75%			00%			+33%							
'01		00%			100%			17%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	798	Dec:	58%			
												'90	599		22%			
												'96	80		25%			
												'01	120		67%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Quercus gambelii																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	1	-	-	1	-	-	-	66		1	
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	84	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	90	-	3	-	-	-	-	-	-	-	3	-	-	-	200		3	
	96	1	-	-	2	-	-	-	-	-	3	-	-	-	60		3	
	01	6	-	-	3	-	-	3	-	-	12	-	-	-	240		12	
M	84	-	1	-	-	-	-	-	-	-	1	-	-	-	66	43	25	1
	90	-	1	-	-	-	-	-	-	-	1	-	-	-	66	57	19	1
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20	48	47	1
	01	8	-	-	-	-	-	-	-	-	8	-	-	-	160	27	16	8
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		17%			00%			00%			-33%							
'90		100%			00%			00%			-70%							
'96		00%			00%			00%			+80%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	399	Dec:	-			
												'90	266		-			
												'96	80		-			
												'01	400		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
S	84	36	-	-	-	-	-	-	-	-	36	-	-	-	2400		36	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	84	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	90	1	-	-	2	-	-	-	-	-	3	-	-	-	200		3	
	96	1	-	-	1	-	-	-	-	-	2	-	-	-	40		2	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	84	2	-	-	-	-	-	-	-	-	2	-	-	-	133	14 16	2	
	90	-	-	-	1	-	-	-	-	-	1	-	-	-	66	5 4	1	
	96	4	-	-	8	-	-	-	-	-	12	-	-	-	240	16 20	12	
	01	3	-	-	4	-	-	1	-	-	7	1	-	-	160	20 31	8	
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	1	-	-	-	-	-	-	-	1	-	66		1	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	5	-	-	-	-	-	-	-	-	1	-	-	4	100		5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%			+40%							
'90		00%			00%			20%			-16%							
'96		00%			00%			00%			- 7%							
'01		00%			00%			31%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	199	Dec:	0%			
												'90	332		20%			
												'96	280		0%			
												'01	260		38%			